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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/817,403

04/01/2004

Kurt Burger

10191/3687

3199

26646 7590 10/01/2009

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EXAMINER

LESLIE, MICHAEL S

ART UNIT

PAPER NUMBER

3745

MAIL DATE

DELIVERY MODE

10/01/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/817,403	Applicant(s) BURGER ET AL.	
	Examiner MICHAEL LESLIE	Art Unit 3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 21-49 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,21-36 and 42-49 is/are rejected.
- 7) ☒ Claim(s) 37-41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection. Claims 1, 2, and 21-49 are pending.

Applicant's arguments with regard to the drawing objections are persuasive, and the objections have been withdrawn due to the admitted conventional nature of the features.

In regard to the objection to claim 36, Applicant's assertion that the quad-rings and x-rings are not the same is not agreed with. The terms quad-ring and x-ring are interchangeable, and conventionally refer to a four lobed seal ring. It is noted that Applicant's specification acknowledges this fact at page 5, lines 27-30. See also <http://en.wikipedia.org/wiki/O-ring> (Section 4 "Other seals").

Claim Objections

Claims 37-41, 43, and 44 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 37 and 43 each provide a broader recitation than required in parent claim 1.

Claims 37 and 43 recite the broad recitation: a three layer configuration, including **(1)** an adhesive layer, **(2)** at least one intermediate layer, and **(3)** a third outermost layer which is one of a metal-free functional layer and metal-containing functional layer.

While claim 1 presents the narrower recitation of: **(1)** an inner adhesive layer including one of a) chromium, and b) silicon; **(2)** at least one intermediate layer including one of a)

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chromium, b) tungsten, c) silicon, and d) carbon; and **(3)** one of a) an outer, metal-free functional layer of diamond-like carbon (DLC), and b) an outer, metal-containing functional layer including tungsten carbide, wherein one of the piston and the sealing elements is made of metal, and another of the piston and the sealing elements is made of an elastomeric material.

Thus it can be seen that claims 37 and 43 do not include every limitation of the parent claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 36 and 42-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant is advised that should claims 34 and/or 47 be found allowable, claims 36 and/or 49, respectively, will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim 42 recites the limitation "g is on the piston and on the sealing elements", which is not understood and renders the claim indefinite.

Claims 43-48 are rejected due to their dependence from claim 42.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 21-33, 42, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over in Volz (5839349) view of Massler et al (DE 10018143) and Applicant's prior art admission (Page 2, Lines 20-24).

Volz discloses a pump device having a metal piston (2, 3) and an elastomeric sealing element (Shown in Fig on Pistons 2, 3). Volz does not teach that at least one of the piston and seal are coated with a coating containing of at least one of halogen-, silicon-, carbon-containing, and metal-organic monomers, wherein the coating includes an inner adhesive layer including one of chromium and silicon, at least one intermediate layer including one of chromium, tungsten, silicon, and carbon, and one of an outer, metal-free functional layer of diamond-like carbon and an outer, metal-containing functional layer including tungsten carbide, or that the elastomeric material includes one of EPDM, viton, turcun, and rubber variants of EPDM.

Massler et al discloses a coating for a pump device having at least one of a piston and sealing elements to seal the pump piston (paragraph [0003]), the at least one of the pump piston and sealing elements having a coating containing of at least one of halogen-, silicon-, carbon-containing, and metal-organic monomers, wherein the coating includes an inner adhesive layer including one of chromium and silicon, at least one intermediate layer including one of

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chromium, tungsten, silicon, and carbon, and one of an outer, metal-free functional layer of diamond-like carbon and an outer, metal-containing functional layer including tungsten carbide (see Abstract).

Applicant has admitted, on Page 2, Lines 20-24, that EPDM is a typical material for sealing rings.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the pump device of Volz to have at least one of the piston and seal coated with a coating containing at least one of halogen-, silicon-, carbon-containing, and metal-organic monomers, wherein the coating includes an inner adhesive layer including one of chromium and silicon, at least one intermediate layer including one of chromium, tungsten, silicon, and carbon, and one of an outer, metal-free functional layer of diamond-like carbon and an outer, metal-containing functional layer including tungsten carbide as taught by Massler et al, wherein the elastomeric material includes one of EPDM, viton, tuncun, and rubber variants of EPDM as taught by Applicant's prior art admission for the purpose of improving efficiency and wear resistance of the pump device.

Claims 34-36 and 47-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Volz (5839349) in view of Massler et al (DE 10018143) as applied to claims 1 and 45 above, and further in view of Harada (5577896).

Volz, as modified, discloses a pump device as described above, but does not teach that the sealing element is a quad-ring having concavely shaped surfaces and four annularly integrated sealing lips.

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Harada discloses a pump having a piston (440) and sealing element (446) wherein the sealing element is a quad-ring having concavely shaped surfaces and four annularly integrated sealing lips.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the pump device of Volz, as modified, to have the sealing element be a quad-ring having concavely shaped surfaces and four annularly integrated sealing lips as taught by Harada for the purpose of improving sealing performance.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. 6093003 and 5213482 disclose further pump devices.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LESLIE whose telephone number is (571)272-4819. The examiner can normally be reached on M-F 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ML
September 29, 2009

/Michael Leslie/
Primary Examiner, Art Unit 3745